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Compartment Syndrome in Association with Tibial Plateau Fracture: A Marker for Poor Outcome

Purpose: To report on treatment, results and longer-term outcomes of patients who sustained a tibial plateau fracture and developed leg compartment syndrome (CS).
Methods: 622 patients who sustained 622 tibial plateau fractures met inclusion criteria. Fourteen patients (2.3%) were diagnosed with compartment syndrome in association with a tibial plateau fracture during their initial hospitalization. Treatment protocol consisted of initial external fixation and fasciotomy, followed by irrigation and debridement, and eventual closure. 2/14 (14.3%) cases included single incision, while 12/14 (85.7%) included dual incision. Operative treatment of the tibial plateau fracture was performed at the time of final closure or once soft tissues permitted. One case of CS that developed following definitive fixation was treated with fasciotomy and delayed primary closure after debridement. We compared these 14 cases to the patients with operative tibial plateau fractures without compartment syndrome to assess for surgical, radiographic, clinical and functional outcomes. Standard statistical methods were employed.
Results: Those in the CS cohort were younger males ($p < 0.05$ and associated with a greater proportion of high energy fracture patterns (85.7 % vs. 47.2%, $p = 0.004$). At latest follow up, function was poorer in those who had developed CS ($p < 0.05$). Clinically, knee flexion was diminished in CS patients (109 vs. 125.3) ($P = 0.0001$). As expected, total complications including nonunion, FRI and repeat unplanned surgery were all greater in the CS cohort ($p < 0.05$). These findings were confirmed in the matched comparison as well. Finally, the complication rate in the matched non-CS group was significantly less as well (7.1% vs. 42.9%).
Conclusion: Despite identification and standardized treatment protocols for the management of CS that develops in association with a tibial plateau fracture, as expected, complication rates are high and outcomes poorer than those without.